THE MINERALS BOOM AND AUSTRALIA'S 'RESOURCE CURSE'

James Goodman and David Worth

Resource wealth in Australia is often presented as an asset, waiting to be exploited. Reflecting this, the recent resource boom is unquestioned - indeed celebrated - as a great windfall for the Australian people. There is a broad-based assumption that Australia's resource-based economy successfully diversified in the later twentieth century, while retaining a foundation in agricultural exports, and latterly minerals. As the saying goes, the country rode to prosperity 'on a sheep's back', and then on the back of the mining sector. The recent resources boom may be seen as simply the latest phase in that process, pump-priming the country's twenty-first century information-age service economy.

The mining boom has undoubtedly been a key foundation of Australia's recent economic growth. But how far should it be welcomed? This article debates the impact of the resource boom in Australia, arguing we should at the very least be willing to discuss whether this presumed blessing is, for many, in fact a 'curse' in disguise. In the context of accelerated climate change, and a continuing rural crisis in Australia, it is salutary to be reminded of what Sheik Ahmed Yamani, long-time Oil Minister of Saudi Arabia, said in regard to their major resource asset: 'All in all, I wish we had discovered water' (quoted in Ross 1999).

The resources curse is highly revealing. With it, the internal contradictions of capitalist development are laid bare. The class contradiction, a labour-capital antagonism between those who benefit from and those bear the costs of accumulation, is borne-out in sharp social divisions created by resource extraction. Spatial antagonisms between contending localities, regions, and states, as played-out in

political tensions and confrontations, reflect underlying capital-to-capital contradictions. Finally, conflicts over ecological sustainability and survival reflect underlying contradictions between nature and capital where resource extraction literally erodes the sub-strata of accumulation. In all three dimensions the logic of resource extraction creates divisions and conflicts, and, especially in terms of ecological impacts, is ultimately suicidal.

The ensuing discussion begins by outlining how the resource curse has been conceptualised internationally. It then moves to address Australian resource curses in terms of capital-labour contradictions as reflected in (i) de-industrialisation and social division, (ii) capital-capital contradictions as played out in forms of regulatory capture and 'energy security', and (iii) capital-nature contradictions in terms of ecological degradation and exhaustion. The analysis feeds into a wider comparative project centring on Western Australia and Alberta, Canada which has the objective of outlining the dimensions of the resource boom and its curses in two similarly booming mining-dependent sub-national provinces. The intention is ultimately to reframe the concept of the resource curse as a tool for analyzing multiple dimensions of dependency, from the local to the global, in this case within high-income industrialized resource economies (see Parkland Institute 2007).

The Resource Curse

The resource curse may be defined as the socio-economic disadvantage, political disruption or environmental degradation that results from dependence on extractive industries. The phenomena is generally identified as an affliction that crosses the North and South, but most intense debate has focused on experiences of resource-dependent low income countries, and the extent to which dependence on resource exports locks these countries into low-growth underdevelopment. The debate has its roots in dependency theory, and turns on the question of whether resource dependency in accordance with presumed comparative advantage imposes systemic disadvantages. Concern at the role allotted to the South under the classical international division of labour, from at least the 1955 Bandung summit, translated into concrete demands in the

early 1970s for a New International Economic Order to enable countries to escape from dependence on resource exports (Ross 1999). The resource curse thesis though did not emerge until the aftermath of the 1970s global resource boom, when many of the countries that had gained substantial resource rents simultaneously experienced surprisingly low economic growth rates. Discussion of the issue waned with the depression in commodity prices in the 1980s, but debate has been renewed with the resources boom of the late 1990s and 2000s driven by rapid economic growth in Asia.

There is broad agreement across the literature that, on the basis of country-level data, resource wealth can be a curse rather than a blessing. Three sets of factors are cited. First there are socio-economic impacts arising from changing terms of trade, weakened non-resource sectors, income volatility, dominance of foreign-owned resource companies, lack of local linkages and enclave-formation in what become sharply dualised societies, divided between locally-affected populations and resource elites. Second there are political aspects stemming from the ready availability of resource rents, especially in terms of patronage, clientelism and corruption, along with cross-national inter-state and corporate dynamics that inter-mesh local structures with geo-economic pressures for resource access (see Lipschutz 2004). Third, there are ecological impacts, which are visited upon immediate living environments in the first instance, but extend far beyond immediate sites of extraction, through the commodity's life cycle.

The key debate is not whether these curses exist, but whether and how they can be avoided (see Ross 1999). Lead players in the reformulation of neoliberal developmentalism have weighed into the debate, including the World Bank, arguing that dependence on mining industries should not in principle be of concern if there are adequate internal governance structures, including exclusively private players in the extraction industry (see Lederman and Maloney 2007; Frieden 2006; Humphreys, Sachs and Stiglitz 2007). For the modernizers Australia is said to have combined minerals dependency with prosperity and, ironically enough for the purposes of this article, is cited as a key example of what can be achieved by an expanding minerals sector (Wright and Czelusta 2007). Others reject this as blame shifting, pointing to new structures of transnational

corporate power that super-accumulate along transnational commodity chains (Dalby 2004), and enable cross-border corruption on an unprecedented scale (Shaxson 2007). This contention over the centrality of external or internal factors is at the core of the debate, reflecting broader confrontations in development studies between dependency and modernization models (Davis 1995).

The Dutch Disease

While most discussion of the resource curse focuses on non-industrialised countries, it does, as noted, reach beyond this category. The main mechanism here is what is referred to as the 'Dutch disease', which should be thought of as one aspect of the resource curse. In high-income countries the disease is seen as aggravating the process of de-industrialisation associated with the rise of the service economy (Palma 2005). The key dimension of the disease is the process of displacing or crowding-out non-mining goods from the export profile (Auty and Warhurst 1993). The primary driver is a rising exchange rate that makes the exports from local manufacturing industries less competitive. The term 'Dutch disease' was coined in 1977 by *The Economist* to describe the experience in The Netherlands, an industrialised country that from the 1960s became dependent on exports of newly-discovered natural gas reserves. The nation experienced a process of accelerated deindustrialization through the resource boom in the 1970s that led to an appreciation in the Guilder, and a reduction in manufacturing exports (1960-1998). The UK experience with the influx of North Sea Oil from 1979 offers a further example - from 1979 to 1984 a deficit in oil exports of £2.2b became a surplus of £6.6b, followed by upward pressure on Sterling and a range of deflationary policies, transforming a £3.6b surplus in manufacturing goods into a £6.3b deficit. (Palma 2005). Oomes and Kalcheva (2007: 4) suggest that Russia may be the latest example of a developed country to have suffered the Dutch disease, given the value of its rapid increase in exports of crude oil and natural gas since 2000.

The onset of resource dependency - or its exacerbation through a resource boom - effectively re-gears the economy to the influx of resource-based rents. A rapid rise in mining incomes creates inflationary pressures, which are managed through deflationary policies, including

the cutting of government social programs. While the export-based mining industry may be little affected by these policies, their effect on other industries can be extensive. In the UK for instance in the 1980s, manufacturing employment declined by 9.2%, whereas the average decline in the EU was only 3.3% (Palma 2005). The conclusion is that the disease, narrowly interpreted, simply sees a country switch from needing to generate a trade surplus in manufacturing exports to being able to rely on a surplus in commodities or services. Indirect effects then extend into the broader structure of political decision-making, with the crowding-out of non-mining sectors paralleled by the displacement of mining-affected communities and the marginalization of non-mining constituencies, including their corporate elites (Ranis 2006).

The reorientation of early industrialisers such as the UK is paralleled by the experience of later 'Newly Industrialised Countries'. The growth of the Chinese economy through the 1980s and 90s, as the world's manufacturing workshop, has had a direct effect on late industrialisers in the immediate East Asian region that have high resource endowments. Much of the region has greatly increased its resource exports to China, creating a regional resource boom that has been displacing labour-intensive manufacturing. For example, Australia provides nearly 40% of China's iron ore imports and over 60% of Japan's (Hansard Western Australia 2007a). Expansion in mining is accompanied by expansion in industrial agriculture, both having the effect of degrading and denuding existing living environments, threatening large-scale resource exhaustion (Coxhead 2007).

But the 'China effect' differs from the earlier cited experiences in Holland and the UK in being demand-driven. The uniquely powerful model of Chinese command capitalism threatens to transform the regional 'miracles' into 'curses'. The process is double-sided, both increasing the growth of extractive activity and under-cutting existing labour-intensive manufacturing sectors. In terms of comparative advantage, such transformations are to be welcomed – they signal a regional restructuring process that allows heightened concentration on high-output activities. In terms of class dynamics the shifts pose a major challenge to livelihoods and living environments, signalling a race to the bottom across the region. The antagonisms that are produced are likely to

be highly spatialised, both in terms of national-level and intra-regional class conflicts, as unevenness is exploited and accentuated by the emergent accumulation model.

Australian Contexts

In 2002 there were fifty-seven countries whose exports of fuel and minerals accounted for more then thirty per cent of merchandise exports. Only three of the fifty-seven were industrialized countries - Australia, Norway and Canada. Stevens and Dietsche define these countries as 'at risk of contracting the "resource curse"'. Given the recent rise in Australia's minerals and fuel exports to now account for about 41 per cent of merchandise exports, we may speculate that Australia now holds a special status even among those three countries (2008: 59).

For some, Australia's anomalous international status (prosperous and resource dependent) is proof of the potential benefits of resource dependency. The dominant account of the impact of mining on the wider economy and society in Australia emphasises its beneficial multiplier effects (Cook and Porter 1984). In this respect, mining is seen as both attracting foreign investment that would otherwise flow elsewhere and providing windfall export earnings that supplement domestic savings rates, enabling heightened rates of accumulation (Stevens and Dietsche 2008). Official estimates of the impact of mining on employment tend to exaggerate its importance. Inclusion of mining services increases employment effects by about fifty percent. In a special report in 2000 the ABS went further, estimating direct mining employment at 80,000, or 1% of total employment; but almost quadrupling to 325000 or 3.8% of the total, with the inclusion of production and processing, assuming these industries would not exist without an extractive industry in Australia (ABS 2000a).

The Australian economy has traditionally run a surplus on its primary commodities (agriculture and mining) to fund a deficit in its manufacturing trade. It is this presumed complementarity between mining and prosperity that is cited as Australia's great lesson. Indeed, the experience since the 1970s mining boom, with rising GDP and

transition to an information economy, 'demonstrates that expansion of a country's mineral base can go hand-in-hand with economic growth and technological progress' (Wright and Czelusta 2007: 201). There is optimism that Australian reserves will expand in the foreseeable future: it is argued that earlier concerns about exhaustion (*eg.* by the Club of Rome) have been allayed by prospecting that has expanded known reserves. The industry is seen as up-grading skill levels and generating technological innovation, including in exploration and environmental clean-up, which are then marketed overseas (Wright and Czelusta 2007).

Against these optimistic accounts, other assessments of the 1970s minerals boom emphasized the extent to which mining would displace other activities. In an early intervention, in 1976, Bob Gregory predicted the process in Australia would disadvantage non-mining sectors, especially the rural sector (Gregory 1976; Cook and Porter 1984). The principal mechanism for this Australian version of the 'Dutch disease' was the exchange rate, which would appreciate with the mining boom, leaving non-mining sectors disadvantaged. Resources would flow to the mining sector, undermining economic diversification, and leading to macro mal-development. The minerals boom was seen as directly undermining Australian efforts to strengthen its manufacturing base and, far from promoting prosperity in the medium term, it was seen as undermining growth prospects. With the onset of a resources boom that in many respects out-booms the 1970s experience, these concerns should be revisited and revised in the light of the now much more clearly defined socio-economic, political and ecological dimensions of the process.

The Boom and Three Curses

As noted, three broad dimensions of the resource curse can be identified – socio-economic, political and ecological. There is evidence of all three in the Australian context – with indications that the mining boom is sharpening social divisions, that rentier corporate and governmental practices are on the increase, and that there is systemic mining-related ecological mal-development. Clearly each of these dimensions overlap,

and correlate, but as outlined here they have distinct dynamics and implications.

Curse 1: de-industrialisation and social division

In terms of the socio-economic dimensions, while mining has grown in importance, manufacturing has declined (Mitchell and Bill 2006). Mining income as a proportion of GDP has not been as high as it is today since the early part of the twentieth century (ABS 2007a). By 2006 the boom brought industry income to 7.5 per cent of GDP, comparing with a peak of 15 per cent in 1861 during the gold rush, and 6 per cent during the last mining boom in 1966-1975 (Cook and Porter 1984).

The current resources boom is definitively export-led. Prices of key mining products have been rising exponentially, primarily as a result of increased demand centred on East and South Asia, with US interventions in the Middle East and early indications of 'peak oil' being contributing factors. Between 2004 and 2006 non-rural commodity prices more than doubled while rural prices remained static (Mitchell and Bill 2006). As a result, mining exports have been increasingly significant: minerals and fuels together accounted for 27 per cent of goods and services exports in 1968, rising to 39 per cent in 2002, and reaching 43 per cent in 2007 (DFAT 2007 and ABS 2007d). In contrast with the 1970s, agricultural exports have been either static or falling (Harris and Taylor 1982). Manufacturing exports have increased but not as rapidly: mining produced an increase in primary exports from $77.7b. in 2002 to $102.4b. in 2007 whereas manufacturing exports rose from $35.2b. to $44b. over the same period.

The picture in the internationally traded sector is reflected across the board: on the overall index of industrial production mining has grown 5.7 per cent since 2004 while manufacturing has grown 1.7 per cent (which includes a 14 point increase in non-metallic minerals processing) (ABS 2007d). Employment in the mining industry, reflecting its capital-intensity, has never been commensurate with its importance to GDP or trade, but it has risen in recent years. In 2001 total employment in the extractive industries stood at 83000, or 1 per cent of the total, rising to 136,000 by 2007, with the key driver being coal mining. In contrast, manufacturing employment actually fell, from 1087,000 in 2004 to 1063,000 in 2007, despite increased manufacturing output (ABS 2007d).

Perhaps most significant, though, is the impact of the resources boom on investment flows. Investment into the industry has been growing. In 2004-05 private new capital expenditure in mining stood at $10.2b. or 18 per cent of the total for Australia. In 2005-06, this almost doubled to $22b. or 29 per cent of the total, which compares with a peak of 13.6 per cent during the 1966-75 mining boom (Harris and Taylor 1982). Most of this increased investment was in coal, oil and gas – key energy sources, and key contributors to greenhouse gas (GHG) emissions. This influx of capital is either coming from other Australian economic sectors or it is coming from international finance markets. In both cases impacts on the non-mining sector are negative. The first starves non-mining sectors of investment funds, while the second has an indirect effect through an appreciating exchange rate and through inflationary pressures in the wider economy.

With manufacturing stagnant and the rural sector in decline the mining boom, both in terms of increased export value and increased inflows of capital, most reasonably explains the recent appreciation in the Australian dollar exchange rate. The rate rose by 14 per cent against the Yen and 11 per cent against the US$ between 2004 and 2006 (Mitchell and Bill 2006). That influence has an impact on the rest of the economy, especially for sectors sensitive to exchange rate appreciation and, as the mining boom generates inflationary pressures, to resulting interest rate rises. Given unprecedented rates of indebtedness across the country (Mitchell and Bill 2006) and, given the concentration of mining incomes in specific enclaves, the spatial impacts are highly uneven and divisive.

At the micro level mining creates deeply divided communities. Mining in Australia is often located away from the metropoles on Crown Land that in practical terms remains the domain of indigenous owners. Mining operations necessarily involve the displacement of such native title claims. In some contexts indigenous groups have been able to exercise negotiation rights, and have secured compensation in terms of royalty flows, service provision and employment (Kaufmann 1998). In other contexts indigenous groups have been played off one against another to secure mining rights, directly undermining community capacity (an important example being intra-indigenous divisions that have been

created at the BHP Billiton Olympic Dam uranium mine in South Australia; see Doyle 2002). While displacing and disadvantaging indigenous owners, mining operations at the same time benefit a small workforce and managerial elite, often co-located in company-owned enclaves in the vicinity of mining operations. The survival of these enclaves depends on the continued operation of the mine, and thereby creates a local corporate-aligned constituency. A good example is the town of Jabiru in the Northern Territory, which houses workers for the nearby Ranger uranium mine. Indigenous owners of the land on which mineworkers live and work inhabit lands abutting the mine, and have entered into long-running disputes to prevent expansion of the mine operations (Goodman 2007).

Local divisions are replicated at the national level, with sharp spatial divides between mining-dependent and manufacturing-focused states and territories. In Australia 45 per cent of mining income and 37 per cent of mining employment is concentrated in Western Australia. While, as noted, mining contributes approximately 7.5 per cent of GDP, in WA it contributes 27 per cent (in 2005-06; ABS 2007c). In 2007 the West Australian Treasurer reported that 'Growth in WA's gross state product is about double the national average. In 2006-07, our economy grew by 6.3 per cent…. The national economy grew by 3.2 per cent.' (Hansard Western Australia 2007b). The WA Commodity price index increased 20 per cent in just one year, June 2006- June 2007 (Department of Treasury and Finance 2007: 84). Major planned projects in Western Australia are mainly resource-based and totaled $140 billion in late 2007 (Department of Treasury and Finance 2007: 54).

While some States, WA included, become more deeply dependent on world minerals markets, for other States which are more reliant on manufacturing and services the national mining boom can be highly destabilizing. Just as mining creates dualisms at the local level, so it creates what has been characterized as the 'two-speed economy' at the national level (Mitchell and Bill 2006). Given the spatial concentration of employment patterns, this can create major problems in terms of deindustrialised neighbourhoods, creating ingrained inequalities within States. Despite the broader national context of financial boom and low unemployment, Mitchell and Bill chart some of the more vulnerable

neighbourhoods in NSW, most particularly in the West of Sydney, that are likely to be most negatively affected by the advancing disruption of manufacturing employment under the resource boom (Mitchell and Bill 2006).

Curse 2: regulatory capture and 'energy security'

Political dimensions overlap with these socio-economic dynamics, but are broader in scope. Government policy during the minerals boom has been deliberately facilitative of expansion. The 1998 Resources Policy Statement set the framework for the up-coming boom, offering an emphasis on certainty in terms of property rights especially in relation to native title rights, competitiveness in terms of offering tax incentives, promoting a self-regulatory approach to environmental protection, and acting internationally as an industry advocate and deal-maker at bilateral and multilateral contexts (see Mercer 2000). The approach has involved an active deregulation of indigenous land rights, especially in relation to rights to negotiate, through the 1998 amendments to the 1993 Native Title Act, and the creation of voluntary codes such as through the 'Minerals Industry Code of Practice for environmental management' and the 'Greenhouse Challenge'. The 1998 statement thus affirmed the capture of Australian Federal policy by the mining industry, to the detriment of other sectors and to subordinates, including mining-affected communities.

Even within the framework of existing resources policy, a key political question is the extent to which mining rents are distributed for public benefit. Unlike most other resource-dependent countries, Australia did not nationalize its extraction industry in the 1960s and 70s, so this is primarily an issue of taxation. Mining in Australia involves a variety of royalty regimes administered by State governments, in addition to federal taxes. Other countries – Norway and Botswana among them – have established savings funds for mining rents so as to ensure revenues are used in the long term interest of the populace (Stevens and Dietsche 2008). These schemes are designed to prevent the waste of windfall rents, the rationale being that, once extracted, mineral wealth is lost to future generations, a secondary consideration being the desire to insulate the national economy from the volatility of commodity markets. Australia has never has such a scheme, and instead has tended simply to

spend the windfall as it passes through the tax office. Neither has Australia instituted a specific regime of taxation, beyond limited royalty payments, to access rising rents during boom times.

It may once have been argued that a relatively generous tax system rewards locally-based mining industry, and thus benefits the local economy. Today, though, Australia has little to speak of in terms of an indigenously-owned mining industry. In fact, the industry is so clearly concentrated in the hands of a small number of transnationalised corporations that it makes little sense to refer to it as an Australian industry as such. There was a period in Australian mining history when multinational mining corporations, sensitive to local concerns, ensured their entities were majority-owned in Australia (Harris and Taylor 1982). For many years, for instance, Rio Tinto maintained only a 49 per cent share of the 'big Australian', BHP. Since the late 1980s such sensitivities at governmental level have subsided, such that in 2001 BHP could be merged with the international mining giant, Billiton, with no objections from the Australian Competition and Consumer Commission or from the advisory Australian Foreign Investment Review Board (Costello 2001). In late 2007, with the proposed merger between BHP Billiton and Rio Tinto, we were presented with the situation of the Chinese Government raising concerns about the monopsony power this might create, while the ACCC and the Australian Government, faced with the prospect of a monopolized mining sector, signaled acquiescence (Alberici 2007).

Not surprisingly Australia's privately-owned, low-taxed, oligopolised and transnationalised mining sector has been in a position to retain much of its windfall gains under the resources boom. The routine process of transnational profit sheltering and tax minimization ensures the rents accrue to the corporates, not to the government (Shaxson 2007). The returns have been substantial. With the rise in commodity prices, there has been a dramatic increase in the value of mining exports, and this has more than doubled pre-tax mining profit, from $13b. in 2001-02 to $21b. in 2004-05, and $33.4b. in 2005-06. Reflecting the structure of the mining industry in Australia, much of that profit has been retained by companies. The total tax-take for minerals and oil and gas actually fell between 2001-02 and 2004-05, from $8.8b. ($3.5b. for minerals, $5.3b.

for oil and gas) to $8.6b. ($3.1b. for minerals, $5.5b. for oil and gas) (ABS 2007b).

Lacking any plans for retaining windfall tax gains from mining, the Federal Government has made extensive political use of the funds to shore up its flagging support through extensive tax cuts. One may speculate on the extent to which windfall tax gains, dating back to the early 2000's, enabled a relatively unpopular Coalition government to remain in power for eleven years. John Howard's longevity as Prime Minister was surely in some significant degree attributable to his government's largesse in terms of recurring budget surpluses and tax cuts. The impact has been particularly highlighted in recent years as Australia's special circumstances have seen it delinked from the US-centred economic cycle: in late 2007 the USA was in a deflationary phase, with falling interest rates, while in Australia inflation had broached the Reserve Bank's 2-3 per cent target range, and further interest rate rises took place. In 2008 the dual economy has come home to roost, with the incoming Labor Government stymied between a booming mining sector and an increasingly recessionary non-mining economy.

The political curses of resource dependence are also played out in international contexts. Rivalry to maintain resource streams – in terms of resource markets as well as supplies - feeds directly into international conflicts and geo-economics (Dalby 2004). In the Australian case the reliance on Asian markets for mining exports draws the Australian government into a range of regional deal-making structures. Australia's two top exports – coal and iron ore – are primarily focused on Asian markets, with 41 percent of coal exports going to Japan, and 54 per cent of iron ore destined for China (DFAT 2007c). In 1965 41 per cent of mining exports were destined for Europe, 41 per cent to Asia; while by 1999 the proportion destined for Europe had fallen to 14 per cent, the proportion to Asia stood at to 64 per cent (ABS 2000a). The recent resource boom has accentuated links to the region, placing a premium on securing trade deals and resource supply contracts. Such efforts centre on striking side agreements regarding the supply of Australian mineral resources, often as part of wider trade negotiations. For example a deal was struck with China on the sidelines of APEC in 2007 which secured

Chinese gas markets for Australia (ABC News 2007). The trade agreements, meanwhile, have the prospect of further exposing Australia-based manufacturing to regional competition, accentuating manufacturing import dependence.

At the same time, concerns for 'energy security' drive much more direct forms of intervention (see Le Billon 2005). Reflecting the relationship between mineral wealth and political rivalry (Fairhead 2001), a range of conflicts have emerged in the mineral-rich 'arc of instability' north of Australia. Australia has played an active role in that arc, deliberately seeking to shore-up the regional interests of Australia-based mining companies. An obvious example in this context is the Australian military blockade of the island of Bougainville after local insurgents closed down a BHP mine in 1989 – at the time one of the world's largest copper mines (as discussed in Le Billon 2005). A more recent example is the Australian diplomatic and military relationship with East Timor, both before East Timor's independence and after, which has revolved around Australian access to oil and gas reserves in the Timor Sea (Cleary 2007). There are other equally revealing cases, complementing broader regional and bilateral efforts at shoring-up Australian 'energy security' in terms of access to resources and markets in the region (Chan, Goodman and O'Connor 2006).

Curse 3: ecological degradation and exhaustion

Finally, and perhaps most importantly, is the question of ecological curses. Extracted mineral and fuel resources are unique in the sense that they cannot be replaced: they are a non-renewable endowment rather than a renewable asset. Once extracted they are lost (Slack 2004). The process of extraction necessarily affects current and future generations, whether through its impact on ancestral domain, community patrimony or the global commons. The unique character of mineral resources, and of the living environments in which they are deposited, renders their value incommensurable, effectively priceless. They cannot therefore be reduced to the cash nexus – which can never adequately reflect their value. As Slack puts it, resource extraction 'goes beyond typical debates over the relative merits of different economic models, reaching to the heart of the long-term viability of life on earth' (2004:14). For these reasons alone governments are under a special responsibility to manage

mineral resources for the good of the peoples and the environments in which they live.

These qualitative aspects of mining are played out in multiple dimensions, but perhaps the most important is the dimension of climate change. The impacts of climate change, predicted for more than three decades (see Harris and Taylor 1982), are most clearly felt in resource dependent regions where climate change is rendering existing economic activity unviable. Clear examples already evident include tourism on the Great Barrier Reef, winter skiing in the Snowy Mountains, and farming communities directly affected by drought and rising temperatures.

The minerals sector and especially the energy sector has a particular impact on GHG emissions. The impact is at least three-fold. First are emissions associated with the process of extraction and processing. Second is the impact felt through the domestic consumption of minerals and fuels. Third is the impact of GHG emissions released as a result of the consumption of energy exports or the upstream processing of exports such as iron ore. Much of Australia's mining exports are driven by export-orientated manufacturing industry in the Asian region. Australian raw materials play a role in the manufacture of consumer durables and other manufactured commodities that find their way from Chinese, Indian and Japanese factories into Australian households. During the boom the Australian economy is thus doubly advantaged, selling mining commodities in return for cheap manufactures: in neither respect, though, are the GHG emissions associated with the lifecycle of the exported minerals attributed to the Australian economy.

Emissions directly released through extraction and processing are relatively easily calculated, at 31 million metric tonnes (mmt), or about 5 per cent of Australia's total emissions of 559 mmt in 2005; emissions directly associated with the burning of fuels for energy in Australia stood at 278 mmt, or 50 per cent of total emissions (DCC 2007). Emissions produced from the offshore burning or processing of Australian minerals – notably coal, iron ore, gas and oil – are harder to calculate. Under the Climate Change Convention GHG emissions are attributed to the country of emission, not to the country of extraction, so Australia's 'offshore' emissions are not calculated.

Figures can be developed though, for individual commodities such as coal, especially significant as Australia, with 30 per cent of global exports, is the world's largest coal exporter (Australian Coal Association 2008). In 2005-2006 for instance, Australia exported 233 million tonnes of coal. Estimates of the average ratio for emissions from a tonne of coal vary from 2.4, as calculated by the Australian Greenhouse Office, to 2.1, as estimated by the United Sates Environment Protection Agency (DCC 2008; USEPA 2008). Taking the more optimistic US EPA estimate this means Australia's coal exports in 2005 produced 490 mmt of GHG emissions. Limiting the estimate to domestic mining and energy, and adding coal exports, the industry produces a total of 780 mmt, or about 140 per cent of the Australian total.

Resource dependence has locked Australia into carbon-intensive energy production. Domestically, between 1973 and 2000 emissions per unit of output in the Australian mining and energy sector increased by 3.5 per cent, in contrast with all other sectors which either reduced or stabilised their emissions intensity. Meanwhile, reliance on coal for electricity increased from 48 per cent to 55 per of total output, ensuring that the rate of emissions per unit of electricity remained hardly changed in thirty years.

In 2003 the Government's own research agency, ABARE, investigated the issue and found total CO2 emissions from fossil fuel combustion increasing at much the same rate as energy consumption levels. Its conclusion – important given the large-scale improvements in energy production technologies over the same twenty-seven year period - was that 'the carbon intensity of energy use was unaffected overall by energy sector developments, when comparing end points of the study period' (ABARE 2003: 57). We may count this as an indirect cost of the mining industry, in terms of cheap coal and gas. For the climate, and thus for society as a whole, cheap minerals supply in Australia is truly a curse.

Conclusions

The resource curse appears to be alive and well in Australia's latest resource boom. Socio-economic dimensions of displacement and de-

industrialisation are evident, with socio-spatial divides deepening at local, inter-state and international scales. Likewise, there are powerful political dynamics at play that favour rentier corporate elites – especially through tax minimization – and encourage concomitant forms of political patronage, along with international rivalries and conflicts. Finally, the Australian resource curse forms part of the broader global 'curse' of climate change, which threatens now to erode the viability of not simply other sectors of the economy but of the entire society. If we are to address these systemic dynamics then we must seriously question the current resource boom.

James Goodman researches global political economy and social movements at the University of Technology Sydney. David Worth completed his PhD in sociology and taught at Murdoch University, Western Australia. He is presently employed as a Senior Research Officer in the Western Australian Parliament; for the past 30 years he has worked in various roles for many social change organisations in both Western Australia and the eastern States. Correspondence to:

james.goodman@uts.edu.au

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